Operating Systems – 2: CS3523

Programming Assignment 1 - Report

* Design of Program:

1. This program gives nearest point to the source from given set of points and time taken to find the nearest points using multithreading.
2. Initially define a struct for coordinates and define source as global variable. Define a function for Euclidean distance which uses the given formula and finds distance between two given coordinates.
3. In main function take the input as per given order and format. getpoint function is defined which takes points in given format. getpoint\_infile function is used to run test cases from points file which is not implemented in code but used for graphs.
4. The points are taken in the form of an array of type coordn(struct). Two global variables points per thread and rempts (remaining points) are defined and values are assigned in main. These values are used in Thread function.

1. Global variable of type coordn\* is defined and memory allocated for Nearpts array, it stores nearest points in each worker thread. Array of threads of type pthread\_t of given number of threads is created. The number of points is divided in each thread using pts\_per\_thread, the last thread takes the remaining points (rempts).
2. In thread function it takes the address of first point of its set as input. The minimum distance is first taken float max and then it is updated by each point by which we find the point with min distance of the set in each thread and it is stored in Nearpts array.
3. In Main thread the point with minimum distance is calculated from the points in Nearpts array and stored in Nearestpt coordn variable using same process as above.
4. Clock starts before pthread\_create function and ends after finding Nearest point. The time (in micro seconds) and nearest points are then printed in the given format.